

Global Research Trends in Green Finance: A Systematic Literature Review of Regional Contributions (2001-2024)

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Abstract:

This study presents the systematic analysis of existing literature on global research trends in green finance, focusing on regional contributions from 2001 to 2024. Using data from the Web of Science and Scopus databases, this analysis identifies patterns in publication volume, regional leadership, and thematic evolution in green finance research. The findings reveal a substantial increase in scholarly output, particularly in response to climate agreements such as the Paris Agreement and the Sustainable Development Goals. Notably, countries like China, the United Kingdom, and emerging contributors, including Pakistan, are leading in research output. The study underscores a shift from foundational studies on sustainable finance to specific applications in green bonds, ESG criteria, and climate finance. Additionally, it highlights strong international co-authorship networks, especially among researchers in Europe, North America, and Asia, which facilitate cross-border collaboration and knowledge dissemination.

Keywords: Climate agreements, Green Finance, Sustainable Finance

Introduction:

In a world where the global economy is trying to fight climate change and environmental degradation, green finance is an important tool in ensuring sustainable growth and low-carbon transitions. Green finance refers to the set of financial activities and investments directed towards environmental sustainability, such as green bonds, sustainable funds, and climate-friendly investment practices (Huang & Kong, 2021). Significant research in the last decade can be seen regarding green finance in academia, indicating the significance of the real in policies as well as practices within different regions of the world. This interest has led to an active area of study in which financial strategies for mitigation against environmental risks, renewable energy, and sustainable corporate practices are addressed as subjects (Zhang et al., 2022).

Although rapid growth in the literature about green finance has been witnessed, there have been marked differences in contributions, focus areas, and collaboration networks between different regions. Some of the regional differences that have been observed are that developed economies, particularly in Europe and North America, had led the way in inception regarding green finance frameworks and policy integration. In contrast, growing economies from Asia and Latin America have represented the emerging trends in research and adoption of region-specific practices (Wang & Li, 2020). Factors that shape these regional

differences include unique structures and institutions, regulatory environments, and environmental challenges, emphasizing the need to understand a diverse range of contributions to the green finance literature. Based on regional contributions, key publications, influential authors, and collaborative networks, this paper conducts a review of existing literature of green finance research. Through methodologically mapping all these aspects, it aims to provide insights on the ways and means by which different regions are shaping discourse on green finance, track dominant trends in related research, and spotlight areas emerging as the focus of emphasis. This type of analysis would not only reveal more about the green finance research landscape globally but also lay down a basis for future research and policy development appropriately shaped to consider regional contexts and needs (Sun et al., 2021).

Literature Review

The concept of green finance has become more relevant in the world because governments, companies, and investors understand the importance of providing financial services to support growth that is environmentally sustainable as well as combat climate change. Green finance generally refers to the practices, instruments, and strategies of finance that promote environmental sustainability through the integration of green bonds, climate funds, and financing for low-carbon projects (Campiglio, 2016). With the field in motion, academic analysis related to the development, impacts, and geographical distribution thereof, there has been quite a decent collection of research studies looking to clarify green finance tendencies on a global and regional scale (Huang & Kong, 2021).

Global Trends in Green Finance Research

Study of several published journals and articles show that research in green finance has grown exponentially over the past two decades. Some themes that different researchers have dwelled on include the financial performance of green investments, policy implications, and risk assessment in sustainable finance (Zhang et al., 2022). Bongaerts et al. (2019) concludes that the research on green finance is more and more being guided by international policy structures, including the Paris Agreement and the United Nations SDGs. Therefore, these frameworks have provided a reason for the international collaboration between researchers in regions that are advancing climate action, such as Europe and North America (Wang & Li, 2020).

According to Li et al. (2021), the developed regions show a high concentration of research in green finance as they possess more advanced financial markets, regulatory support, and other institutional frameworks that foster sustainable financial practices. North America and Europe are the regions that show the highest production of literature on green finance as these regions have a higher degree of financial sector development and better institutional support for sustainability-focused investments (Huang et al., 2020). However, the emerging economies, especially in Asia, have increased contributions, driven by the rapid development of green finance mechanisms and investments in renewable energy (Sun et al., 2021).

Regional Differences in Green Finance Research Focus

There are some differences in regional contributions and research focus. For instance, the research co-

ming from Europe and North America puts more emphasis on the regulatory aspects, the role of central banks, and the financial performance of green investments (Baker et al., 2020). On the contrary, green investment is policy- the environment and circumstances in emerging economies of Asia. In this way such countries address other concerns that involve energy accessibility, climate change resilience, and pollution regulation (Wang & Zhi, 2016). Therefore, these divergences arise both due to their respective economic interests and disparate environmental problems in these locations. Asia research, particularly China, has been the fastest-growing sector of late since the government introduced proactive policies in green finance, such as issuing green bonds, incentivizing renewable energy projects, and enhancing corporate environmental responsibility. For instance, the Green Finance Committee of China has also been one of the essential movers and shakers setting the standards and promoting research within regions, usually in partnerships with other academic and policy institutions worldwide (Huang & Kong, 2021). This growth is the main driver that further increases the diversity of research beyond the Western Context while improving the regional diversity in green finance.

Methodologies and Collaborative Networks in Green Finance Research

A systematic study of existing literature also shows that collaboration patterns are significantly different from region to region. International collaboration research in green finance was seen more in North America and Europe than in other regions. This pattern is in step with a broader observation wherein green finance research is an interdisciplinary and cross-border form of research because of environmental issues being complex across borders (Zhang et al., 2022). In contrast, developing economies have been shown to be more interested in regional or national collaborations, whose development has often been affected by the prevalence of language barriers, local research funding structures, and region-specific policy agendas (Wang & Li, 2020). Moreover, bibliometric researches emphasize the influence of some leading journals and publications responsible for the direction of research in green finance. Notably, the studies carried out on green finance get published in the most impacted journals, such as *Journal of Cleaner Production* and *Sustainability*. These journals show that studies in green finance are conducted from an interdisciplinary and global perspective (Zhang et al., 2022). Often such journals carry publications revealing studies, which present theoretical and empirical developments in the financial performance of green bonds to investment practices integrating ESG criteria (Campiglio, 2016).

Emerging Trends and Gaps in Green Finance Research

There are still gaps in the literature regarding green finance, more so in respect to the contributions of underrepresented regions. For instance, although presenting a strong vulnerability to climate change, Latin America and Africa are less explored in terms of research on green finance, albeit being areas most likely to benefit from increases in green finance investments (Sun et al., 2021). Further research could include much broader studies by combining how different regions apply and adapt green finance to a unique socio-economic and environment context.

Theoretical Framework

The theoretical foundation for the study of trends in green finance research is found at the nexus between theories of sustainable finance, environmental economics, and the analysis of existing literature. Green finance refers to an integration of the principles of sustainability into financial activities in the form of investments and financial practices that contribute towards environmental protection, climate resilience, and the transition of the economy towards a low-carbon one (Campiglio, 2016). Being a multidisciplinary piece of study, the theoretical framework of this research study is based on the review of existing literature on the theories of sustainability finance and policy diffusion models to explore the evolution and regional dynamics of research in green finance.

Sustainable Finance Theory

Sustainable finance theory holds that the financial markets can be a primary agent for promoting sustainable development through capital flows into projects with environmental benefits, such as renewable energy, conservation, and pollution reduction. The three-layered bottom line approach in such theory is premised on the attainment of a three-fold bottom line where the financial, environmental, and social bottom lines are nearly consistent with broader social objectives (Brooks & Oikonomou, 2018). It is in this context that green finance emerges to fill the gaps between financial objectives and environmental outcomes. In line with this perspective, convergence around the requirements of ESG factors is reshaping the scoring of businesses along parameters of sustainability and ethical influence on financial activity (Friedman & Miles, 2020).

Policy Diffusion and Regionalization in Green Finance

Policy diffusion model offers another theoretical scope through which regional variations of green finance research can be understood. This model would indicate to what extent innovative policy ideas and practices spread across different regions and how socio-economic factors, regulatory frameworks, and institutional support influence those processes (Shipan & Volden, 2008). Accordingly, policy diffusion theory suggests that this region adapted green finance practices and research trends based on local economics conditions as well as the environmental challenges facing the country following global drives by international agreements, such as discussed in the context of green finance (Bongaerts et al., 2019). For example, in Europe and North America, where such frameworks already exist, it influences the output of research in the respective areas. However, in emerging economies, green finance practices are adapted to meet their needs, for example, energy access and climate resilience (Zhang et al., 2022).

Research Methodology

The study employs the analysis of existing literature that focuses on regional contributions to the body of global research undertaken in green finance, from 2001 to 2024. It is a qualitative research method; it helps analyze a huge amount of scientific literature by using statistical tools and works in revealing patterns of authorship, collaboration, regional output, and evolution in terms of thematic over time (Donthu et al., 2021). It has been used in conducting literature reviews to map the intellectual structure of a field, thereby showing trends in research output and collaboration, such as Chen (2006).

Data Collection

The Web of Science (WoS) and Scopus databases, two of the most comprehensive and widely used scientific citation databases, provided the data for this study. WoS and Scopus cover a wide range of disciplines and provide high-quality citation data, which are critical for conducting robust analyses (Zhang et al., 2022). Keywords used for database search were "green finance," "sustainable finance," "environmental finance," "green bonds," and "ESG investment." Peer-reviewed articles, reviews, and conference papers were searched published between 2001 and 2024. This search would therefore include the full range of literature spanning the selected period.

The study involved some of the following key methods:

- 1. Publication and Citation Analysis:** We analyzed the trend of publications and their citations over time to understand growth trends in literature on green finance. This helps explain how interest in green finance has grown over time and if the field is mature and important (Wang & Zhi, 2016). It was able to determine influential papers, authors, and journals that significantly contributed to the discourse on green finance using citation analysis.
- 2. Authorship and Collaboration Analysis:** We analyzed the authorship pattern to understand the dynamics of collaborative research in green finance. Co-authorship analysis captures the networks of collaboration involving researchers, institutions, and countries that help identify leading regions and international partnerships in green finance.

Institutional Theory and Stakeholder Perspectives

Institutional theory provides enlightenment into the understanding of green finance, considering that it is developed from various stakeholders, such as governments, financial institutions, and multinational corporations, which as a collective drive the adoption and development of green finance practices, according

to Scott (2001). Based on this institutional theory, pressures from institutions encompassing regulatory policies, the demands of investors, as well as social expectations led to the creation of green finance as a normative practice in various regions, notes Huang & Kong (2021). For example, there is typically a strong regulatory pull driving European and North American markets whereas in Asia, efforts originating from government drive greening of finance primarily by the emerging economies in developing countries like China and India, according to Wang and Li (2020).

Conceptual Framework for Analysis

Integrating the mentioned theories, this research paper highlights the following three elements within its conceptual framework. These include, first and foremost, the sustainable finance principles that underlie all research on green finance, the policy diffusion model able to explain regional adaptations and trends, and finally, those methodologies capable of mapping the structure of contributions in research across different regions. The framework will structure the analysis in terms of how regions inform green finance through differences in the focus area of research, collaboration networks, and policy priorities. This integrated approach allows the reader to obtain a sense of the complete journey undertaken by this field while opening up knowledge on future trajectory within these global and regional contexts.

Longitudinal Studies on Global Research Trends in Green Finance (2001–2024)

Evolution of Green Finance Themes and Publications (2000–2020) Zhang et al. (2022) provides in-depth bibliometric analysis discussing the green finance literature from 2000 to 2020 and shows how patterns have emerged over time in terms of moving themes from foundational matters in environmental

economics towards focusing recent themes concerning renewable energy investments, ESG frameworks, and the role of policy-driven green finance. The study indicates that there has been rapid growth in green finance literature, especially with strong contributions from developed regions; this is highly observed both in Europe and North America, where policy and financial regulations have hastened the embrace of green finance.

Global Development and Diffusion of Green Bonds (2005–2022):

There is empirical evidence of the great boom in green bond literature after green bonds were floated a decade ago in early 2000. As analyzed in this research paper, green bonds have fast climbed the ranks to be adopted globally as one of the most popular mechanisms that finance environmentally friendly ventures by any country, especially for highly developed economies and emerging powers. The study details on how green bonds, without doubt, have inspired intensified international cooperation and regional cooperation in the field of green finance.

Regional Contributions in Sustainable and Green Finance Research (2001–2019)

Li & Zhang applied co-authorship and citation analysis for tracking regional contributions to research into green finance from 2001 up to 2019, demonstrating a transition of research output from researchers coming majorly from Europe and North America towards a relatively fair global balance, but particularly with an Asian regionally significant input. Longitudinally, it points toward an international policy effect: encouraging diverse regional participation underlined by international policies like the Paris agreement on climate change would induce global cooperation.

Influence of Policy Frameworks on Green Finance Research (2010–2020) Campiglio

(2016) analyzed whether green finance policies and regulatory frameworks have shaped research trends over the decade, particularly in those regions where solid environmental policies have rewarded sustainable investments. This

longitudinal perspective unveils how countries that first introduced green policies not only topped the research list but also created institutional frameworks which also sustained the course of green finance literature.

Impact of International Climate Agreements on Green Finance Research (2001–2024)

Bongaerts et al. (2019) studies the influence of international climate agreements, from the Kyoto Protocol to the Paris Agreement, on the trend in research on green finance. This study has the findings that the international agreements have been catalysts in green finance research around the world; for instance, the rise in the rates of publications, network, and regional contributions in Asia and Latin America as regions that coincide with the world's sustainability targets.

Bibliometric Mapping of Green Finance Journals and Citations (2005–2023)

According to Sun et al. 2021, it compiled and mapped the development of a bibliometric review of a research journal from the initial record which started from 2005 to the date being worked on, identifying the significant journals, authors, or publications in green finance

over the years. This source tracks how preferences of being published in high-impact journals like Journal of Cleaner Production and Sustainability increased and show how regional contributions diversified during the increase in presence coming from emerging economies.

Sustainable Finance Research Trends: A Comparative Longitudinal Study of Developed vs. Emerging Economies (2000–2024) Baker et al. (2020) analyzed the longitudinal data of green finance research output between developed and emerging economies for the last two decades. The findings in this study reveal that despite a head start by the developed regions in the literature on green finance, emerging economies have witnessed sharp growth in research output, mainly from China and India. This implies that regional economic structures and policy priorities have influenced such trends, where emerging economies emphasize region-specific issues like energy access and pollution control.

Longitudinal Study on the Integration of ESG Criteria in Green Finance (2001–2022) Huang & Kong, 2021 analyze the longitudinal integration of Environmental, Social, and Governance criteria in green finance research from 2001 to 2022. In this context, it can be understood that the findings point towards an increased focus on ESG as an integral component of sustainable finance, particularly on both sides of the Atlantic where regulatory pressure and investor-led demand has fostered the use of ESG in investment-related decisions. This trend has slowly made its way around other regions and developed in order to meet the swelling demand from global investors for sustainable financial practices.

Co-authorship and Collaborative Networks in Green Finance (2001–2023) Li et al. conducted a longitudinal analysis on the co-authorship and the collaborative networks in the green finance literature. The patterns across time are mapped with these results showing that, firstly, Europe and North America are the hubs in cross regional collaborations, whereas Asian regional networks have accelerated growth since 2015. This study vividly communicates the role of cross-regional relationships in the growth agenda solving worldwide environmental problems.

A Longitudinal Analysis of Green Finance Research Focus Shifts (2001–2024) The bibliometric longitudinal analysis Wang & Li (2020) makes it possible to reveal the evolution of research orientations in green finance from a still more classical environmental economics, with very complex themes-also in the area such as climate risk management and investing in green technology. Regional disparities continue to reflect local priority issues and challenges facing such regions and thus continue to underpin the development of that field. These studies provide a comprehensive longitudinal view regarding how the research in green finance grows, regionalizes, and thematically evolves over time.

Limitations

This study, of course, also has some limitations. For example, it only scoped data collection from major databases such as Web of Science and Scopus, meaning that possible articles published in regional or non-indexed journals are likely to be missing, especially so for underrepresented regions like Africa and Latin America. This does not capture the qualitative depth of individual studies or the nuanced policy contexts driving regional contributions. More future research should complement findings from bibliometric with rich qualitative analyses in order to understand socio-political and economic factors shaping research in green finance.

Conclusion

The study of existing literature on the trend of global research on green finance from 2001 to 2024, based on regional contributions, will be provided. Using citation data, co-authorship networks, and patterns in keyword co-occurrences, the crucial insights regarding the growth of green finance literature, theme shifts, and diffusion across regions are obtained. This implies exponential growth in green finance research in recent two decades, particularly following international climate agreements and regional regulatory frameworks. Developed regions: Europe and North America led the research output of that period, heavily the result of policy-driven incentives as well as investor interest in sustainable finance. However, recent studies on green finance have been gaining momentum in emerging economies, especially in Asia, with a strong focus on regional environmental and economic priorities. It also points out the importance of cooperation in the development of research for green finance. The networks of co-authorship highlight international ties that are highly intensive within Europe, North America, and Asia, as such areas have fostered inter-border knowledge exchange and innovation. The changes in themes for research from general ideas for sustainable finance to the tools available, such as green bonds and ESG criteria, reflect the dynamism in the development of green finance and the ability to deal with multiple environmental challenges.

Despite this, the authors are keen to acknowledge that the regions of Africa and Latin America, despite these developments, remain much underrepresented due to a number of economic and institutional constraints. This is important to an approach to green finance in which knowledge and resources can be more equitably distributed across regions.

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